N00104-89-R-MA21
ITEM 187 FY90
CEL-DS1
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PURCHASE DESCRIPTION

SYNTHESIZED SIGNAL GENERATOR (10 kHz to 2600 MHz)

FSNVM-B

1.0 GENERAL This procurement requires a programmable synthesized signal generator employing no more then two plug-ins and covering a frequency range of 10 kHz to 2600 MHz.

2.0 CLASSIFICATION The synthesized signal generator described herein shall meet the requirements of MIL-T-28800D , Type III, Class 5, Style E, Color R for the Navy shipboard, submarine, and shore applications with the following exceptions:

a. The non-operating temperature requirement is limited to the range of -40˚C to +70˚C.

b. The relative humidity requirement is limited to 95% noncondensating.

c. The operating and non-operating altitude requirements are not invoked.

d. The EMI requirement is not invoked.

e. The warm-up time is extended to 72 hours.

3.0 OPERATIONAL REQUIREMENTS. The equipment shall be capable of generating signals within the parameters and accuracies specified herein.

3.1 Frequency Characteristics {F = carrier frequency}

3.1.1 Frequency Range: At least 10 kHz to 2600 MHz

3.1.2 Frequency Resolution: 1 Hz [F < 1.3 GHz]; 2 Hz [F > 1.3 GHz]

3.1.3 Frequency Stability

3.1.3.1 Internal: At least $\pm 3 \times 10^{-9}$/day
3.1.3.2 External: Equal to external standard frequency stability

3.1.4 Spectral Purity

3.1.4.1 Harmonics/Sub-harmonics: < -25 dBc [F < 1.3 GHz]; < -20 dBc [F > 1.3 GHz]
3.1.4.2 Non-Harmonics/Spurious: At least -50 dBc
3.1.4.3 Single Sideband Phase Noise: Less than -100dBc/Hz at 10 kHz offset

3.1.5 Reference Frequency

3.1.5.1 Internal Reference Oscillator: 10 MHz
3.1.5.2 External Reference Oscillator: 5 or 10 MHz, 0.5 to 2.0 Vrms into 170 ohms

3.2 Output Characteristics

3.2.1 Range: +10 to -136 dBm [F < 1.3 GHz]; + 7 to -136 dBm [F > 1.3 GHz]

3.2.2 Accuracy: ±2.0 dB [F < 110 MHz]
±2.5 dB [> -70 dBm]; ±3.5 dB [< -70 dBm] [1 MHz < F < 2.6 GHz]

3.2.3 Flatness: ±2.0 dB

3.2.4 Digital Sweep: Auto, single, or manual operation with selectable speeds 0.1, 1.0 or 50 seconds

3.3 Modulation Characteristics

3.3.1 Amplitude Modulation (AM)

3.3.1.1 Internal AM
3.3.1.1.1 Rate: At least 400 Hz and 1 kHz ±5%
3.3.1.1.2 Depth: At least 0 to 90% [F < 1.3 GHz]; 0 to 50% [F > 1.3 GHz]
3.3.1.1.3 Accuracy: ±10% of full scale
3.3.1.1.4 Distortion: Less than 5% at 50% depth and 1 kHz rate

3.3.1.2 External AM
3.3.1.2.1 Rate: At least 20 Hz to 10 kHz [F > 4 MHz]; 20 Hz to 5 kHz [0.4 < F < 4 MHz] 0 Hz to 100 Hz [F < 0.4 MHz]
3.3.1.2.2 Depth: At least 0 to 90% [F < 1.3 GHz]; 0 to 50% [F > 1.3 GHz]
3.3.1.2.3 Accuracy: ±10% of full scale
3.3.1.2.4 Distortion: Less than 5% at 50% depth and 1 kHz rate
3.3.1.2.5 Input impedance: 600 ohms

3.3.2 Frequency Modulation (FM) {ΔF = FM deviation}

3.3.2.1 Internal FM
3.3.2.1.1 Rate: At least 400 and 1 kHz ±5%
3.3.2.1.2 Deviation: At least 0 to 1 MHz [F < 110 MHz]; 0 to 200 kHz [1 MHz < F < 1.3 GHz]
0 to 400 kHz [F > 1.3 GHz]
3.3.2.1.3 Accuracy: ±5% of full scale

3.3.2.2 External FM
3.3.2.2.1 Rate: At least dc to 1 MHz [F < 110 MHz]; dc to 200 kHz [1 MHz < F < 2.6 GHz]
3.3.2.2.2 Deviation: At least 0 to 1 MHz [F < 110 MHz]; 0 to 200 kHz [1 MHz < F < 1.3 GHz]
0 to 400 kHz [F > 1.3 GHz]
3.3.2.2.3 Distortion: <3% [ΔF < 1 MHz @ rates < 20 kHz]
3.3.2.2.4 Input impedance: 600 ohms

4.0 General Requirements

4.1 Power: 115/230 vac ±10%, single phase, 50, 60 or 400 Hz ±10%, 350 watts maximum

4.2 Calibration Interval: The calibration interval shall be 12 months minimum. The equipment shall be within all accuracy requirements specified herein, with a 72% or greater confidence factor following a calibration interval of 12 months.

4.3 Dimensions: The total volume of the unit shall not exceed 2828 in^3 (46,342 cm^3) with a maximum height of 7.25 in.

4.4 Weight: The total weight of the unit shall not exceed 66 lbs (30 kg).

4.5 Remote Programming: The generator shall be capable of being remotely controlled via the IEEE-488 interface bus, operating as both a talker and listener, having at least the following subset of bus functions: AH1, L4, SH1, T6, SR1,DC1, and RL1.